

REMARKS

Claims 79 to 81 and 83 to 97 are pending in this patent application. No claims have been amended, canceled, or added, herein. Applicants respectfully request reconsideration of the rejections of record in view of the following remarks.

Alleged Obviousness

A. Claims 79 to 81, 83, and 84 have been rejected under 35 U.S.C. § 103(a) as allegedly rendered obvious by Conrad, B., *et al.*, *Eur. J. Biochem.*, 1995, 230, 481-490 (“the Conrad article”) in view of U.S. patent number 5,736,499 (“the Mitchinson patent”). Applicants respectfully request reconsideration and withdrawal of this rejection because the cited references actually teach away from the claimed cleaning agents.

To establish *prima facie* obviousness, the Patent Office must demonstrate that the cited prior art reference or combination of references teaches or suggests all the limitations of the claims.¹ The Patent Office must also identify “a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.”² In other words, the Office must identify “an apparent reason to combine the known elements *in the fashion claimed by the patent at issue*. To facilitate review, this analysis should be made explicit.”³

Prior art references that serve as the basis of an obviousness rejection must be considered by the Patent Office in their entirety, *i.e.*, ***the references must be considered as a whole***, including portions that would lead away from the claimed invention.⁴

Claim 79 recites cleaning agents that comprise a chimeric amylolytic protein comprising an amino acid sequence that is at least 98 % identical to the amino acid sequence set forth in SEQ ID NO:8. The cited references fail to teach or suggest such cleaning agents, and actually

¹ *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974); *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

² *KSR Int'l Co. v. Teleflex*, 127 S.Ct. 1727, 1741.

³ *KSR Int'l. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (emphasis added)(citing *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006)).

⁴ M.P.E.P. § 2141.02 (citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983)).

teach away from the cleaning agents. For example, the Conrad article describes hybrid α -amylases that contain portions of the *Bacillus amyloliquefaciens* and *Bacillus licheniformis* α -amylases.⁵ Specifically, the article describes a hybrid enzyme containing the amino-terminal 34 amino acids of the *Bacillus amyloliquefaciens* α -amylase fused to the complementary carboxyl-terminal segment of the *Bacillus licheniformis* α -amylase (“AL34”), a hybrid enzyme containing the amino-terminal 76 amino acids of the *Bacillus amyloliquefaciens* α -amylase fused to the complementary carboxyl-terminal segment of the *Bacillus licheniformis* α -amylase (“AL76”), and a hybrid enzyme containing the amino-terminal 112 amino acids of the *Bacillus amyloliquefaciens* α -amylase fused to the complementary carboxyl-terminal segment of the *Bacillus licheniformis* α -amylase (“AL112”).⁶ Significantly, the article indicates that although AL34 exhibited *slightly* elevated thermostability relative to wild type *Bacillus amyloliquefaciens* α -amylase, AL76 and AL112 exhibited *reduced* thermostability relative to wild type *Bacillus amyloliquefaciens* α -amylase.⁷ Specifically, Figure 3 of the article indicates that AL76 exhibited approximately 85 % of the thermostability of wild type *Bacillus amyloliquefaciens* α -amylase, AL112 exhibited approximately 82 % to 92 % of the thermostability of wild type *Bacillus amyloliquefaciens* α -amylase, and AL34 exhibited approximately 1 % to 2 % greater thermostability than wild type *Bacillus amyloliquefaciens* α -amylase.

Accordingly, those skilled in the art would have had *no reason* before applicants' invention to incorporate hybrid α -amylases, such as AL34, AL76, and AL112, into detergent compositions in light of the *reduced* thermostability of the AL76 and AL112 enzymes, and the *marginally* enhanced thermostability of the AL34 enzyme, relative to the wild type *Bacillus amyloliquefaciens* α -amylase. Those skilled in the art would have understood that α -amylases utilized in detergents must be highly thermostable to withstand the high-heat conditions under which detergents are normally used. There would thus have been little advantage, and there likely would have been disadvantages, associated with utilizing the hybrid α -amylases described

⁵ Figure 2.

⁶ *Id.*

⁷ Figure 3.

in the Conrad article in detergent compositions relative to utilizing a wild type enzyme, and those skilled in the art thus would have had no reason to do so before applicants' invention.

The Mitchinson patent does not compensate for the deficiencies of the Conrad article. For example, the Mitchinson patent describes mutant α -amylases and teaches that the α -amylases may be used as an ingredient in detergents.⁸ Significantly, the patent indicates that enhanced thermostability of α -amylases is useful for extending the shelf life of products containing α -amylases, and reduced thermostability may be useful in industrial processes that require the rapid and efficient quenching of amylolytic activity.⁹ As understood by those of ordinary skill in the art, enhanced thermostability of α -amylases, rather than reduced thermostability, is advantageous for detergents containing such enzymes in light of the high heat at which detergents present in washing and cleaning products are normally used. Those skilled in the art would have further understood that rapid quenching of amylolytic activity during the cleaning process reduces the level of cleaning that results.

Those skilled in the art thus would not have been led to utilize the hybrid α -amylases described in the Conrad article in the detergent compositions described in the Mitchinson patent at the time of the invention, and actually would have been *led away* from doing so, due to the fact that the Conrad article teaches that the AL76 and AL112 enzymes exhibit reduced thermostability relative to wild type *Bacillus amyloliquefaciens* α -amylase, and the AL34 enzyme only exhibited marginal enhancement in thermostability relative to the wild type enzyme. The claimed cleaning agents comprising chimeric amylolytic proteins that comprise an amino acid sequence that is at least 98 % identical to the amino acid sequence set forth in SEQ ID NO:8. thus would not have been obvious before applicant's invention in view of the teachings of the cited references.

The Office asserts, however, that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the exceptionally thermostable hybrid AL34, AL76 and AL112 α -amylases taught by Conrad et al. in a detergent composition/cleaning

⁸ Col. 6, lines 61-62.

⁹ Col. 8, line 60 to col. 9, line 2.

agent of Mitchinson et al...because such an artisan would have readily appreciated that the hybrid AL34, AL76 and AL112 α -amylases of Conrad et al. are appropriate components for such a cleaning composition in view of their exceptional thermostability.”¹⁰ The Office has apparently failed to consider the teachings of the Conrad article as a whole, however, including the portions of the article that teach away from combining the article’s teachings with those of the Mitchinson patent. Notably, “[t]t is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one skilled in the art.”¹¹ Specifically, the Office has not addressed, and apparently did not consider, the portions of the Conrad article that indicate that AL76 and AL112 exhibited reduced thermostability relative to wild type *Bacillus amyloliquefaciens* α -amylase, suggesting that hybrid α -amylases, rather than wild type enzymes, would not be appropriate materials for detergents and cleaning compositions. The Office has thus failed to consider what the entirety of the Conrad article would have fairly suggested to those skilled in the art at the time of the invention, and has thus failed to recognize that those skilled in the art would have understood that the Conrad article’s teachings could in all likelihood not have been successfully combined with the teachings of the Mitchinson patent. When the teachings of the cited references are *considered as a whole*, the claimed cleaning agents would not have been obvious at the time of the invention in view of the references, and applicants accordingly, respectfully, request withdrawal of the rejection.

B. Claims 85 to 97 have been rejected under 35 U.S.C. § 103(a) as allegedly rendered obvious by the Conrad article and the Mitchinson patent in view of U.S. patent number 6,656,899 (“the Sadlowski patent”). Applicants respectfully request reconsideration and withdrawal of this rejection because it appears to be based upon the assumption that the Conrad article and the Mitchinson patent teach or suggest all the limitations of claim 79. Since this

¹⁰ Office action dated September 30, 2008, page 3.

¹¹ See *Bausch & Lomb, Inc. v. Barnes-Hind, Inc.*, 796 F.2d 443, 448 (Fed. Cir. 1986)(quoting *In re Wesslau*, 353 F.2d 238, 241 (C.C.P.A. 1965)).

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assumption is believed to be incorrect, for the reasons discussed above, applicants respectfully request withdrawal of this rejection.

Conclusion

Applicants believe that the foregoing constitutes a complete and full response to the official action of record. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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